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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 09/720,710 | 06/01/2001 | Vanessa Z.H. Chan | M0925/7067 | 5662 |
| 7590 08/30/2007 | | | | |
| Timothy J Oyer Wolf Greenfield & Sacks Federal Reserve Plaza 600 Atlantic Avenue Boston, MA 02210-2211 | | | EXAMINER CHANG, VICTOR S | |
| | | | ART UNIT 1771 | PAPER NUMBER |
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

09/720,710

Applicant(s)

CHAN ET AL.

Examiner

Victor S. Chang

Art Unit

1771

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 August 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-148 is/are pending in the application.
- 4a) Of the above claim(s) 2-16, 18-22 and 25-148 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 17, 23 and 24 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/C)
- Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Introduction

1. Applicants' remarks filed on 8/16/2007 have been entered. Claims 1, 17, 23 and 24 are active.
2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Rejections Based on Prior Art

3. Claims 1, 17 and 23 are rejected under 35 U.S.C. 102(b) as being anticipated by Lee et al. [Macromolecules, 22, pp. 2602-2606].

Lee's paper [Introduction; pp. 2602-2603] relates a porous membrane prepared from a film of block copolymer synthesized by anionic polymerization of poly(4-vinylphenyl)dimethyl-2-propoxysilane and poly(isoprene). Depending on architecture of the block copolymer and casting conditions, periodic microstructures of the porous membrane can be formed by controlled morphology of the segregated domains of the block copolymer. After crosslinking, the poly(4-vinylphenyl)dimethyl-2-propoxysilane domain, the poly(isoprene) block is decomposed to form a continuous hollow domain through the membrane. Narrow molecular weight distributions of the block lengths of the copolymer result in uniform micropores. Micrographs of the block copolymer films I and II, and the resulting porous membrane reveal that the periodic microstructures of the original block copolymer are directly reflected in the shape and size of the micropores.

For claims 1 and 17, it is calculated that the atomic% of silicon atom in the terminal blocks of poly(4-vinylphenyl)dimethyl-2-propoxysilane is $1/35 = 2.86$ atomic%, i.e., it is about 3 atomic% as claimed. As to the limitation “an inorganic species capable of forming a ceramic oxide”, since the claimed limitation is optional, there is no requirement for the prior art to provide or account for the limitation, i.e., it does not constitute a limitation in any patentable sense.

For claim 23, Lee discloses that glass transition temperature of the terminal silicon containing block is about 465°K (193°C), which is greater than 0°C (pp. 2603).

4. Claim 24 is rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Lee et al. [Macromolecules, 22, pp. 2602-2606].

The teachings of Lee are again relied upon as set forth above.

For claim 24, Lee discloses that the terminal silicon containing block has average degree of polymerization of 100 (pp. 2602-2603), or average molecular weight of 22,000, i.e., about 30,000. Alternatively, since Lee discloses the same subject matter for the same use (a porous membrane having periodic microstructures) as the instant invention, and teaches that depending on the architecture of the block copolymer, the shape and size micropores can be designed, a suitable average molecular weight of the silicon containing block is deemed to be either anticipated by Lee, or an obvious routine optimization, motivated by the desire to obtain designed micropore sizes required by end use.

Response to Argument

5. Pointing to the definition of "topologically continuous" in the specification [pp.13, ll.32 – pp.14, ll.2] as meaning "continuous, in the sense that a particular domain in a periodic, polymeric structure forms a continuous pathway through the structure", applicants argue [Remarks pages 23-26] that the presently claimed invention cannot be found in Lee reference, because the structures in Lee do not have two, topologically continuous domains, and the structures in Lee are based on block copolymers having lamellar, cylindrical, and spherical domains, which define physically isolated discrete domain structures. However, in accordance with the definition of "topologically continuous" in the specification, the examiner asserts that Lee's invention anticipates the structure of the claimed invention. Applicants have ignored Lee's teachings that with sufficient polyisoprene block length (molecular weight), block copolymers I and II forms microporous membranes with a three-dimensionally periodic structure and their hollow domains are topologically continuous throughout the membrane structure. Applicants' conclusive remarks that block copolymers necessarily forms physically isolated discrete domain structures appear to analyze the prior art in a vacuum without any factual support.

Conclusion

6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after

the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Victor S. Chang whose telephone number is 571-272-1474. The examiner can normally be reached on 8:30 - 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Terrel H. Morris can be reached on 571-272-1478. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Victor S Chang/
Victor S Chang, Ph.D.
Primary Examiner, Art Unit 1771

8/28/2007

